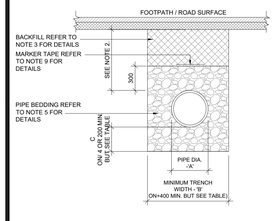
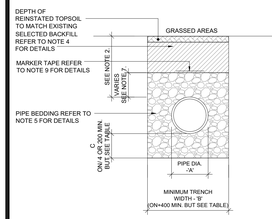


1. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE
2. THE MINIMUM DEPTH OF COVER FROM THE FINISHED SURFACE TO THE CROWN OF GRAVITY PIPES WITHOUT PROTECTION SHOULD BE AS FOLLOWS :
   A) GARDENS AND PATHWAYS WITHOUT ANY POSSIBILITY OF VEHICULAR ACCESS - DEPTH NOT LESS THAN 0.5 M. (THIS WOULD NORMALLY RELATE TO DRAINS IN PRIVATE PROPERTY . SHALLOW PIPES OF THIS NATURE ARE UNDESIRABLE AND SHOULD BE INSTALLED IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS)
   B) DRIVEWAYS, PARKING AREAS AND YARDS WITH HEIGHT RESTRICTIONS TO PREVENT ENTRY BY VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 0.75 M .
   C) DRIVEWAYS, PARKING AREAS AND NARROW STREETS WITHOUT FOOTWAYS (E.G.MEWS DEVELOPMENTS) WITH LIMITED ACCESS FOR VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 0.9 M .
   D) DEPTHS OF SEWERS IN GATED ESTATES SHALL BE SIMILAR TO THAT OUTLINED ABOVE .
   E) AGRICULTURAL LAND AND PUBLIC OPEN SPACE - DEPTH NOT LESS THAN 0.9 M .
   F) OTHER HIGHWAYS AND PARKING AREAS WITH UNRESTRICTED ACCESS TO VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 1.2 m. IF THE MINIMUM COVERS LISTED ABOVE ARE NOT ACHIEVED THE PIPES ARE TO BE FULLY ENCASED IN CONCRETE AS PER DETAIL B2.
3. CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE TII SPECIFICATION FOR ROAD WORKS IS TO BE USED AS BACKFILL MATERIAL WHERE THE SEWER MAIN IS LOCATED IN ROADS, FOOTPATHS OR WHEN THE NEAREST PART OF THE TRENCH IS WITHIN 1 m OF THE PAVED EDGE OF THE ROADWAY. CLAUSE 808 IS TO BE COMPACTED AS PER CLAUSE 802 OF THE TII SPECIFICATION FOR ROAD WORKS
4. SELECTED EXCAVATED MATERIAL (eg. CLASS 2C MATERIAL TO TABLE 6.1 OF TII SPECIFICATION FOR ROADWORKS) MAY BE USED IN GREEN - FIELD AREAS ABOVE GRANULAR PIPE SURROUND MATERIAL SUBJECT TO THE APPROVAL OF THE EMPLOYERS REPRESENTATIVE.
5. PIPE BEDDING SHALL COMPLY WITH WIS 4-08-02 AND IGN 4-08-01 GRANULAR MATERIAL SHALL BE 14 mm TO 5 mm GRADED AGGREGATE OR 10 mm SINGLE SIZED AGGREGATE B EN 13242 CONCRETE BED , HAUNCH & SURROUND WHERE REQUIRED (NOTE: CONCRETE BED AND HAUNCH REQUIRED IN AREAS TO BE TAKEN IN CHARGE BY DUBLIN CITY COUNCIL) , SHALL BE TO DETAIL B1
6. IN SOFT GROUND CONDITIONS (CBR < 5) THE MATERIAL SHOULD BE EXCAVATED AND DISPOSED OF IN ACCORDANCE WITH THE WASTE MANAGEMENT ACT AND CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE TII SPECIFICATION FOR ROAD WORKS SHALL REPLACE THE EXCAVATED MATERIAL, WRAPPED IN GEO - TEXTILE WRAPPING . ALTERNATIVELY , SPECIAL PIPE SUPPORT ARRANGEMENTS , INCLUDING PILING ETC . MAY BE REQUIRED WHERE THE DEPTH OF SOFT MATERIAL IS EXCESSIVE.SUCH ARRANGEMENTS SHALL BE SUBJECT TO ASSESSMENT BY THE EMPLOYERS REPRESENTATIVE BEFORE ADVANCING WITH THE WORK .
7. IN GREEN FIELD AREAS , TYPE B BACKFILL (SELECTED EXCAVATED MATERIAL) WILL BE ALLOWED ABOVE THE SIDE HAUNCH GRANULAR MATERIAL IN THE CASE OF RIGID PIPES . A GRANULAR SURROUND OF A MINIMUM DEPTH OF 150 mm ABOVE THE CROWN OF THE PIPE IS REQUIRED FOR FLEXIBLE PIPES , AND TYPE B MATERIAL MAY BE USED AS BACKFILL ABOVE THIS . ALL RISING MAINS IN GREENFIELD AREAS SHALL HAVE A MINIMUM COVER OF 300 mm OF GRANULAR MATERIAL ABOVE THE EXTERNAL CROWN OF THE PIPE.
8. PIPES SHALL NOT BE SUPPORTED ON STONES , ROCKS , OR ANY HARD OBJECTS AT ANY POINT ALONG THE TRENCH . ROCK SHALL BE EXCAVATED TO A DEPTH OF 150 mm BELOW THE ACTUAL DEPTH OF THE TRENCH WITH THE VOID FILLED WITH CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE TII SPECIFICATION FOR ROAD WORKS . THE GRANULAR MATERIAL SHALL BE LAID ABOVE THIS VOID BACKFILL MATERIAL.
9. NON DEGRADABLE MARKER TAPE SHOULD BE INSTALLED AT TOP OF PIPE BEDDING LAYER .
10. TRENCH WIDTHS FOR PIPE SIZES 80 mm MAY BE < 500 mm , SUBJECT TO CONSIDERATION BEING GIVEN TO THE TRENCH DEPTH , HEALTH & SAFETY & CONSTRUCTION ACCESS REQUIREMENTS .

A1 CROSS SECTION IN PAVED AREAS



A2 CROSS SECTION IN GRASSED AREAS

PIPE MATERIALS

UNLESS SPECIFICALLY NOTED OTHERWISE IN THE DRAINAGE LAYOUT THE PIPE MATERIAL WILL BE AS FOLLOWS:

PIPE DIAMETER ≤ 150mm: USE uPVC PIPE WORK
PIPE DIAMETER >150mm USE CONCRETE PIPE WORK***

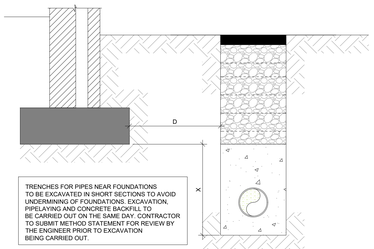
PIPE MATERIAL TO BE IN ACCORDANCE WITH THE FOLLOWING:

1. CONCRETE PIPES TO HAVE SPIGOT & SOCKET JOINTS AND RUBBER RING FITTINGS TO IS EN 1916 (2002); BS5911, PART 1 , (2002- 2010) AND IS 6 (2004).
   STRENGTH CLASS 120
2. VITRIFIED CLAY PIPES & FITTINGS TO HAVE FLEXIBLE JOINTS AND TO COMPLY WITH IS EN 295- 1/2/ 3 - CLASS 160 OR CLASS 200
3. uPVC PIPES , JOINTS AND FITTINGS TO COMPLY WITH THE PROVISION OF IS EN 1401- PART 1 AND BS 4660

*** NOTE: FOR BURIED SURFACE WATER DRAINAGE, THERMOPLASTIC STRUCTURED WALL PIPES MAY BE PERMITTED FOR PIPE DIAMETERS OF >150mm & ≤ 450mm SUBJECT TO APPROVAL OF CORK CITY COUNCIL DRAINAGE SECTION. PIPES SHALL COMPLY WITH THE PROVISIONS OF IS EN 13476 (2007/2009) AND SHALL BE OF STIFFNESS CLASS 8kN/m2 (SN8) FOR PIPE DIAMETERS >100mm & ≤300mm AND OF STIFFNESS CLASS 6kN/m2 (SN6) FOR PIPE DIAMETERS ≥ 375mm & ≤450mm .

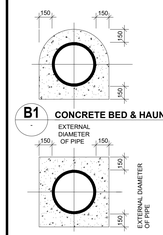
PIPE DIAMETER A (mm)	TRENCH WIDTH B (mm)
80 RISING MAIN	SEE NOTE 10.
100	500
150	600
200	600
250	750
300	750
350	750
400	900
450	900
750	1500

A TRENCH BACKFILL AND BEDDING



WHERE 'D' IS LESS THAN 2x
(CONCRETE FILL TO LEVEL OF FOUNDATION BOTTOM)

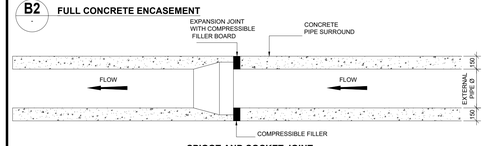
C DRAIN LAID NEAR FOUNDATION



B1 CONCRETE BED & HAUNCH

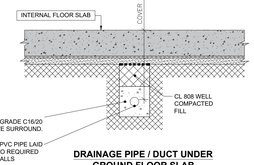
1. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.
2. CONCRETE PIPE BEDS AND HAUNCHES MAY BE REQUIRED TO ADDRESS MINIMUM COVER SITUATIONS, AND SHALL BE SUBJECT TO SUBMISSION AND ASSESSMENT BY THE EMPLOYERS REPRESENTATIVE BEFORE ADVANCING WITH THE WORKS.
3. CONCRETE PIPE BEDS AND HAUNCHES SHALL HAVE MINIMUMTHICKNESS OF 150 mm WITH AN ABSOLUTE MINIMUM DEPTH OF COVER ABOVE THE EXTERNAL CROWN OF THE PIPE OF 150 mm .
4. CONCRETE TO BE IN ACCORDANCE WITH IS EN 206 AND TO BE CLASS C 16 / 20.
5. THE HAUNCHES AND SURROUNDS TO BE FORMED USING FORMWORK TO PROVIDE A ROUGH CAST FINISH .
6. EXPANSION JOINTS IN THE CONCRETE SHALL BE PROVIDED AT ALL PIPE JOINTS TO ALLOW FOR PIPE FLEXIBILITY . COMPRESSIBLE FILLER BOARD TO BE IN ACCORDANCE WITH BS EN 622-1 AND BS EN 622-4. AND TO BE 18mm THICK.
7. POLYETHYLENE PIPES SHALL BE WRAPPED IN PLASTIC SHEETING HAVING A COMPOSITION IN ACCORDANCE WITH BS 6076 BEFORE BEING CAST INTO CONCRETE.
8. BITUMINOUS MATERIAL SHALL NOT BE PUT IN CONTACT WITH PE OR PVC PIPES .

B2 FULL CONCRETE ENCASEMENT



SPIGOT AND SOCKET JOINT

B CONCRETE HAUNCH, BED & SURROUND

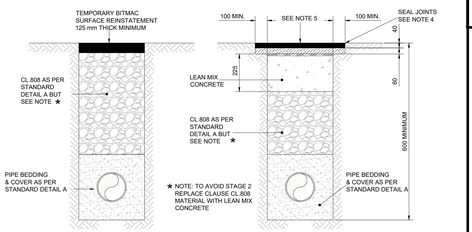


DRAINAGE PIPE / DUCT UNDER GROUND FLOOR SLAB
(SCALE @ A0 1:25)

J TYPICAL INTERNAL BURIED DRAINAGE/ DUCT DETAIL

NOTES:

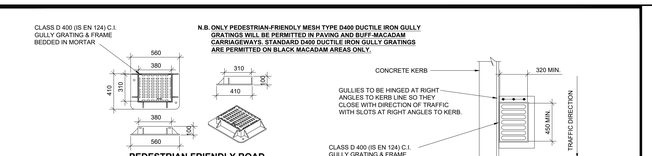
1. FORM A SAW CUT 100mm DEEP AT A MIN. OF 100mm FROM SIDES OF EXCAVATION PRIOR TO PERMANENT REINSTATEMENT. WHERE ANY TRIM LINES ARE WITHIN 400mm OF ROAD EDGE, JOINT OR OTHER REINSTATEMENT, THE TRIM LINE SHOULD BE EXTENDED TO THE INTERFACE OF SUCH SITUATIONS.
2. LEAN-MIX SURFACE TO BE SPRAYED AS PER CLAUSE 920 (TII SPEC.) PRIOR TO APPLICATION OF BINDER COURSE MACADAM.
3. 100°C HOT BITUMEN BINDER 50 PEN OR COLD THIXOTROPIC BITUMEN 50 - 70 PEN TO BE APPLIED TO ALL VERTICAL CUTS IN ACCORDANCE WITH BS EN 13108-4 PRIOR TO APPLICATION OF BITUMINOUS MATERIAL
4. JOINTS SEALED WITH HOT BITUMEN AND TOPPED WITH FINE SAND / GRIT TO GET A MINIMUM 55 SKID RESISTANCE VALUE AS DETERMINED BY THE PORTABLE SKID RESISTANCE PENDULUM USED IN ACCORDANCE WITH ROAD NOTE 27 AND SHALL NOT EXCEED 3mm THICKNESS AND 25mm WIDTH.
5. SURFACE REINSTATEMENT:
   ASPHALT CONCRETE ROAD -
   40mm MIN THICK OF 'SMA 10 surf 70/100 des' SURFACE COURSE TO IS EN 13108 and NSA's S28; ON 60mm MIN THICK OF 'AC 20 dense bin 70 /100 des' BINDER COURSE TO IS EN 13108 AND NSA's S28; ON BITUMEN SPRAY TO CI.920 OF TI SPECIFICATION FOR ROAD WORKS ON 225mm THICK LEAN MIX CONCRETE. SAW CUT AND REINSTATE TO 100mm FROM EDGE OF TRENCH EXCAVATION. JOINTS SEALED WITH HOT BITUMEN AS NOTE 4.



STAGE 1
LEAVE FOR 6 MONTHS TO CONSOLIDATE

STAGE 2
DIG OUTSURFACING & TOP 225mm OF CL 808 MATERIAL & REPLACE WITH NEW WIDER SURFACING ON 225mm LAYER OF LEAN-MIX CONCRETE SEE NOTE ABOVE FOR DETAILED METHOD STATEMENT

D REINSTATEMENT OF PIPE TRENCH IN EXISTING ROAD

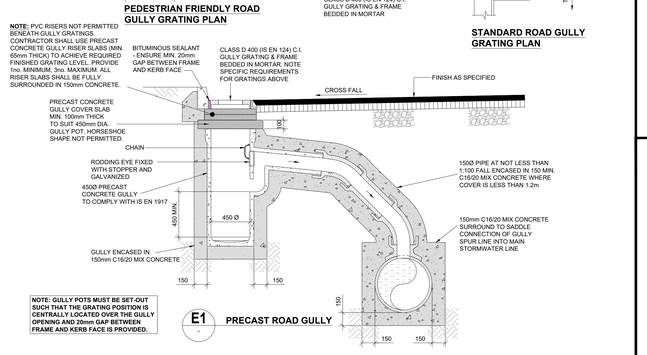


N.B. ONLY PEDESTRIAN-FRIENDLY MESH TYPE D400 DUCTILE IRON GULLY GRATINGS WILL BE PERMITTED IN PAVING AND BUFF-MACADAM CARRIAGEWAYS. STANDARD D400 DUCTILE IRON GULLY GRATINGS ARE PERMITTED ON BLACK MACADAM AREAS ONLY.

PEDESTRIAN FRIENDLY ROAD GULLY GRATING PLAN

STANDARD ROAD GULLY GRATING PLAN

NOTE: PVC RISERS NOT PERMITTED BENEATH GULLY GRATINGS. CONTRACTOR SHALL USE PRECAST CONCRETE GULLY RISER SLABS (MIN. 65mm THICK) TO ACHIEVE REQUIRED FINISHED GRATING LEVEL. PROVIDE 1no. MINIMUM, 3no. MAXIMUM, ALL RISER SLABS SHALL BE FULLY SURROUNDED IN 150mm CONCRETE.



NOTE: GULLY POTS MUST BE SET-OUT SUCH THAT THE GRATING POSITION IS CENTRALLY LOCATED OVER THE GULLY OPENING AND 20mm GAP BETWEEN FRAME AND KERB FACE IS PROVIDED.

E1 PRECAST ROAD GULLY

E TYPICAL SECTION THROUGH ROAD GULLY

NOTES

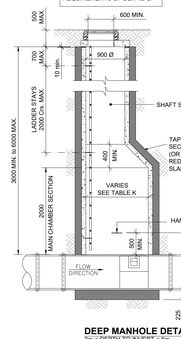
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - ASK.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. WASTE DRAINAGE DETAILS TO BE IN ACCORDANCE WITH IRISH WATER REQUIREMENTS UNLESS NOTED OTHERWISE. REFER TO IRISH WATER DETAILS FOR ADDITIONAL INFORMATION.
4. CONNECTION OF BRANCHES TO THE MAIN LINE ARE TO BE BY MEANS OF 45° BRANCH CONNECTIONS. SADDLE CONNECTIONS ARE ONLY PERMITTED FOR CONNECTING GULLY TAILS TO BRANCHES/MAINLINES.
5. INTERNAL GROUND FLOOR FOUL CONNECTIONS TO DRAIN SEPARATELY FROM THE UPPER STOREYS.
6. ALL BURIED PIPES UNDER GROUND FLOOR SLABS TO BE ENCASED IN CONCRETE.
7. CONTRACTOR TO NOTE REQUIREMENTS FOR PEDESTRIAN FRIENDLY GULLY GRATINGS ON THE GRANITE SHARED SURFACE CARRIAGEWAY. AND BUFF MACADAM ROADS. THESE SHALL BE A MESH TYPE D400 GRADE DUCTILE IRON GRATING. ROAD GULLIES IN BLACK MACADAM AREAS REQUIRE STANDARD D400 ROAD GULLY GRATINGS. **ALL ROAD GULLY GRATINGS TO BE MIN. D400 RATING.**
8. REFER TO DRAWING C-1204 FOR PERMEABLE PAVING DRAINAGE AND SuDS DETAILS.

TABLE K

MANHOLE PIPE Ø A	CHAMBER INTERNAL Ø B
225	1200
300	1200
375	1200
525	1200
600	1200
675	1350
750	1500
900	1500
1050	2100
1200	2100

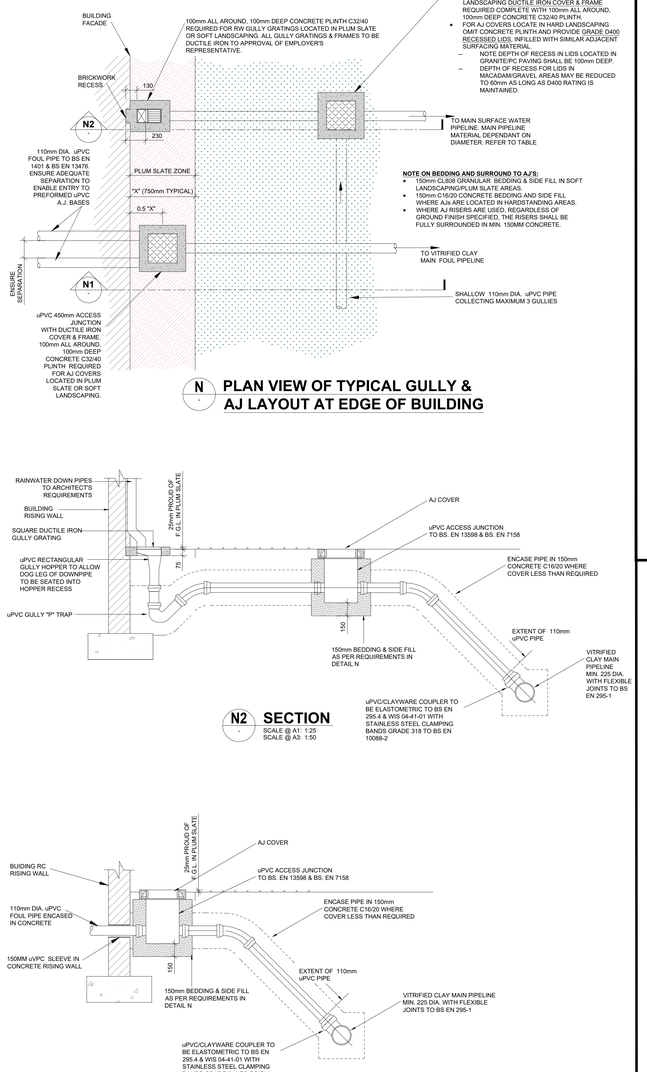
ALTERNATIVE DETAIL
(REDUCING SLAB INSTEAD OF TAPER SECTION)

NOTE: UNLESS OTHERWISE NOTED IN THIS DETAIL & ALL MANHOLES SHALL COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION DOCUMENT & REQUIREMENTS OF DETAIL G.



DEEP MANHOLE DETAIL
3m & DEPTH TO INVERT < 6m

K TYPICAL SECTION THROUGH DEEP MANHOLE



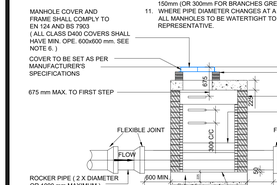
NOTE ON ACCESS JUNCTION COVERS:
- FOR AJ COVERS LOCATED IN PLUM SLATE OR SOFT LANDSCAPING DUCTILE IRON COVER & FRAME REQUIRED COMPLETE WITH 100mm ALL AROUND, 100mm DEEP CONCRETE C32/40 PLINTH.
- FOR AJ COVERS LOCATE IN HARD LANDSCAPING OMIT CONCRETE PLINTH AND PROVIDE GRADE D400 RECESSED LIDS. INFILLED WITH SIMILAR ADJACENT SURFACING MATERIAL.
  - NOTE DEPTH OF RECESS IN LIDS LOCATED IN GRANITE/PC PAVING SHALL BE 100mm DEEP.
  - DEPTH OF RECESS FOR LIDS IN MACADAM/GRAVEL AREAS MAY BE REDUCED TO 60mm AS LONG AS D400 RATING IS MAINTAINED.

NOTE ON BEDDING AND SURROUND TO AJ'S:
- 150mm CL808 GRANULAR BEDDING & SIDE FILL IN SOFT LANDSCAPING/PLUM SLATE AREAS
- 150mm C16/20 CONCRETE BEDDING AND SIDE FILL WHERE AJs ARE LOCATED IN HARDSTANDING AREAS.
- WHERE AJ RISERS ARE USED, REGARDLESS OF GROUND FINISH SPECIFIED, THE RISERS SHALL BE FULLY SURROUNDED IN MIN. 150MM CONCRETE.

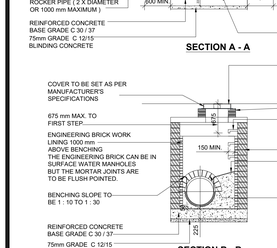
N PLAN VIEW OF TYPICAL GULLY & AJ LAYOUT AT EDGE OF BUILDING

N2 SECTION
SCALE @ A1: 1:25
SCALE @ A3: 1:50

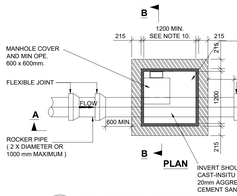
N1 SECTION
SCALE @ A1: 1:25
SCALE @ A3: 1:50



SECTION A - A

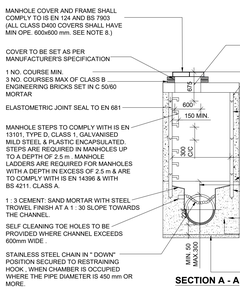


SECTION B - B



F BLOCKWORK MANHOLE < (450mm DIAMETER & DEPTH TO INVERT < 2m)

1. ALL DIMENSIONS ARE IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE
2. SOLID BLOCKWORK TO BE OF HIGH STRENGTH (20 N/mm) TO IS EN 771.
3. MAXIMUM DEPTH OF BLOCK WORK MANHOLE IS 2.0 m (THE USE OF BLOCK WORK IN DEEPER MANHOLES WILL BE CONSIDERED BUT SUCH USE WILL REQUIRE DETAILED STRUCTURAL DESIGN AND WRITTEN APPROVAL FROM THE EMPLOYERS REPRESENTATIVE).
4. WALLS TO BE FLUSH POINTED INTERNALLY .
5. FOR FOUL MANHOLES PROVIDE. INTERNAL LINING OF ENGINEERING BRICK TO IS EN 771-1 TO A HEIGHT OF 1m ABOVE BENCHING. ENGINEERING BRICK TO BE BONDED TO BLOCK WORK USING ENGLISH GARDEN WALL BOND. STRUCTURAL DESIGN AND REINFORCEMENT DETAILS FOR BOOT AND BASE SLABS TO BE PROVIDED BY THE CONTRACTOR AND SUBMITTED TO THE EMPLOYERS REPRESENTATIVE FOR REVIEW.
6. COVERS AND FRAMES SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS SUBJECT TO APPROVAL FROM THE EMPLOYERS REPRESENTATIVE. STANDARD D400 DUCTILE IRON ROUND MANHOLE COVERS REQUIRED IN BLACK MACADAM AREAS AND SOFT LANDSCAPED AREAS. RECESSED SQUARE MANHOLE LIDS TO MIN. GRADE D400 IN ALL OTHER AREAS.
7. 200mm ALL AROUND. 100mm DEEP CONCRETE PLINTH AROUND COVERS IN GREEN AREAS.
8. ALL CHAMBERS TO BE CHECKED FOR UPLIFT BY THE CONTRACTOR BASED ON GROUND CONDITIONS WITHIN THE SITE . SHOULD ANTI FLOATATION MEASURES BE REQUIRED THEY SHALL BE SUBJECT TO APPROVAL FROM THE EMPLOYERS REPRESENTATIVE.
9. ALL CONCRETE TO BE ACCORDANCE WITH IS EN 206: 2013.
10. BRANCH PIPES INTO MANHOLES: BENCHING TO BE SHAPED SO AS TO GUIDE THE FLOW IN THE FLOW DIRECTION. THE MINIMUM LENGTH OF THE MANHOLE BASED ON THE SIDE WITH THE GREATEST NUMBER OF BRANCHES EQUAL TO 300mm PLUS THE SUM OF THE BRANCH DIAMETERS PLUS 200mm PER BRANCH FOR BRANCHES UP TO 150mm (OR 300mm FOR BRANCHES GREATER THAN 150mm DIAMETER).
11. WHERE PIPE DIAMETER CHANGES AT A MANHOLE THE PIPE CROWNS ARE TO LINE UP.
12. ALL MANHOLES TO BE WATERTIGHT TO THE SATISFACTION OF THE EMPLOYERS REPRESENTATIVE.


MANHOLE COVER AND FRAME SHALL COMPLY TO IS EN 124 AND BS 7903 (ALL CLASS D400 COVERS SHALL HAVE MIN OPE. 600x600 mm. SEE NOTE 8.)
COVER TO BE SET AS PER MANUFACTURER'S SPECIFICATION
1 NO. COURSE MIN. 3 NO. COURSES MAX OF CLASS B ENGINEERING BRICKS SET IN C 50/60 MORTAR
ELASTOMETRIC JOINT SEAL TO EN 681
MANHOLE STEPS TO COMPLY WITH IS EN 13101, TYPE D, CLASS 1, GALVANISED MILD STEEL & PLASTIC ENCAPSULATED. STEPS ARE REQUIRED IN MANHOLES UP TO A DEPTH OF 2.5 m . MANHOLE LADDERS ARE REQUIRED FOR MANHOLES WITH A DEPTH IN EXCESS OF 2.5 m & ARE TO COMPLY WITH IS EN